



THE ATMOSPHERIC RESERVOIR

Examining the Atmosphere and Atmospheric Resource Management

Thunderstorms and Aircraft Safety

by Bruce Boe

One of the first things student pilots are taught is thunderstorm recognition, and how to maintain safe distances from them. The “safe distance” is usually prescribed as being somewhere between 20 and 50 miles.

There are several very good reasons for this. Thunderstorm hazards include aircraft icing, large hail, lightning, and extreme wind shears. Some of these may be found miles from the precipitating portion of the storm. Though all of these dangers are very real, it is the last of these, the abrupt changes in wind direction and speed, that presents the greatest risk.

In cloud seeding, aircraft are employed in two ways. Precipitation development can be accelerated and hail reduced either by releasing seeding agents directly into the tops of a storm’s growing cloud turrets, or by their release in the rising air currents—the updrafts—below these same, rain-free turrets. The cloud seeding pilot is thus faced with a serious dilemma: how to safely get close enough to these billowing, hazard-laden clouds to deliver the seeding agents needed to mitigate hail and increase rainfall.

To safely fly in the vicinity of thunderstorms, one must learn how thunderstorms form and evolve, and be able to recognize and interpret many storm features. This knowledge is not gained just by watching a videotape, or by successfully completing the ground school required to



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become a licensed pilot. The subject matter is far too complex.

The typical cloud seeding pilot’s training begins with two semesters’ course work at the University of North Dakota’s John D. Odegard School of Aerospace Sciences. This is followed by an internship as a copilot for a season (three months) on the North Dakota Cloud Modification Project (NDCMP). During the internship, the fledgling pilot flies with an experienced pilot-in-command (PIC) to learn firsthand how to recognize safe and unsafe places to fly, and where to place the aircraft to seed clouds effectively. Only then may the pilot become a PIC in a subsequent NDCMP season.

However, knowledge alone does not make one a safe pilot around thunderstorms. Flight crews must perpetually question the safety of every situation in which they find themselves.

They must constantly review the storm growth and motion, visibility, available alternate airports, ground

clearance, where they are relative to the storm, and where the storm is relative to the target area. The only way to safely fly around thunderstorms is to *never* take chances, and to *always* think ahead. Where safety is concerned, the PICs are trained to rely ultimately upon themselves and their instrumented aircraft, and little else.

Since cloud seeding with aircraft began in North Dakota in 1961, some 35,000 hours have been safely logged by project aircraft, much of it during nighttime. The strong project emphasis on safety is no accident. But make no mistake—thunderstorms are significant aviation hazards. As is often said on TV, “Don’t try this at home (yourself).” ■

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